



FORMULATION AND EVALUATION OF HERBAL SOAP BY USING MORINGA OLEIFERA AS MAIN ACTIVE CONSTITUENTS

1Prasad Sanjay Borade, 2Prof. Anil .B. Jadhav

1Student, 2Professor

1Nandkumar shinde college of pharmacy vaijapur

ABSTRACT

The majority of commercial soaps include chemicals and synthetic ingredients that may be irritating or even damaging to the skin. Human's skin, which need special treatment for healing, improved skin tone, and the appearance of glowing health. Herbal soaps found in nature are another viable option. Herbal products have double meaning: first, they are used as cosmetics for body care, and second, the presence of photochemical and botanicals in them results in naturally healthy skin. Herbalism and the usage of herbal products are now popular trends. Indian herbs are the most abundant source utilised in the cosmetic industry. As more people know the health benefits and cost-effectiveness of herbal products, their use is growing rapidly all across the world.

So, In this research, we used the cold process technique to create a herbal soap .In order to make herbal soap namely (coconut oil, Glycerine , Moringa oleifera extract, C. sinensis peel Powder, and sodium hydroxide (Iye) was used, and the various extracts were afterwards combined into the primary saponification process. After completion of the herbal formulation, it was tested for its pH, moisture content, foaming index, foam retention time, and high temperature stability, etc. Various study found that, these herbal plant extracts proven to possess anti-bacterial activity, anti-inflammatory activity, anti-fungal activity, etc. The findings for the manufactured herbal soap reveal that these soap are cost-effective, convenient, generates nice foam on application and do not exhibit any skin irritation.

KEYWORDS: Soap, natural ingredients, skin care , evaluation.

INTRODUCTION

Skin :-

The skin is the body's largest organ and its exposure to the environment makes it vulnerable to a wide range of skin diseases/ailments (eczema, acne, and other skin conditions). In order to avoid skin problems, it's important to keep the body's largest organ clean and free of any microbes that could be floating about. Skincare herbal formulations that fight fungi, bacteria and microbes may be made from any number of plant components, including the stem, leaves, roots, bark, flower, and fruit. These pharmaceuticals are often produced in the form of a cream, lotion, gel, soap, and ointment when they are intended for topical use. One of the most popular formulations for skincare and the treatment of skin ailments is herbal soap.

Soap is a salt of fatty acids that may be found in many household cleaning and personal care items. Soaps have several uses in the home, the most common of which are washing, bathing, and general cleaning study, we can develop a herbal soap using various herbal extracts. That is believed to have no or little negative effects.

Herbal soaps that include herbal extracts should have considerable antibacterial, antimicrobial, anti-aging, anti-oxidant, and antiseptic action, promote skin conditioning, have a great foam, have a pleasant aroma, and be soft on the skin. Herbal soaps don't include any man-made additives and chemicals such as synthetic fragrances, flavours, fluoride. Herbs as from beauty of nature have been used to treat a wide range of skin problems, from the very moderate to the really serious. The use of various herbal medicines for the treatment of skin infections has been investigated by many traditional medical systems, including the Ayurvedic, Siddha, and Unani systems of medicine.

Herbal pharmaceuticals are in more demand than their synthetic counterparts for a variety of reasons, including the following

- Minimal Adverse Effects
- Enhanced safety and effectiveness
- Easily accessible
- Improved compatibility with other ingredients
- significant curative effect
- Increased tolerability for all skin tones
- Cost effective

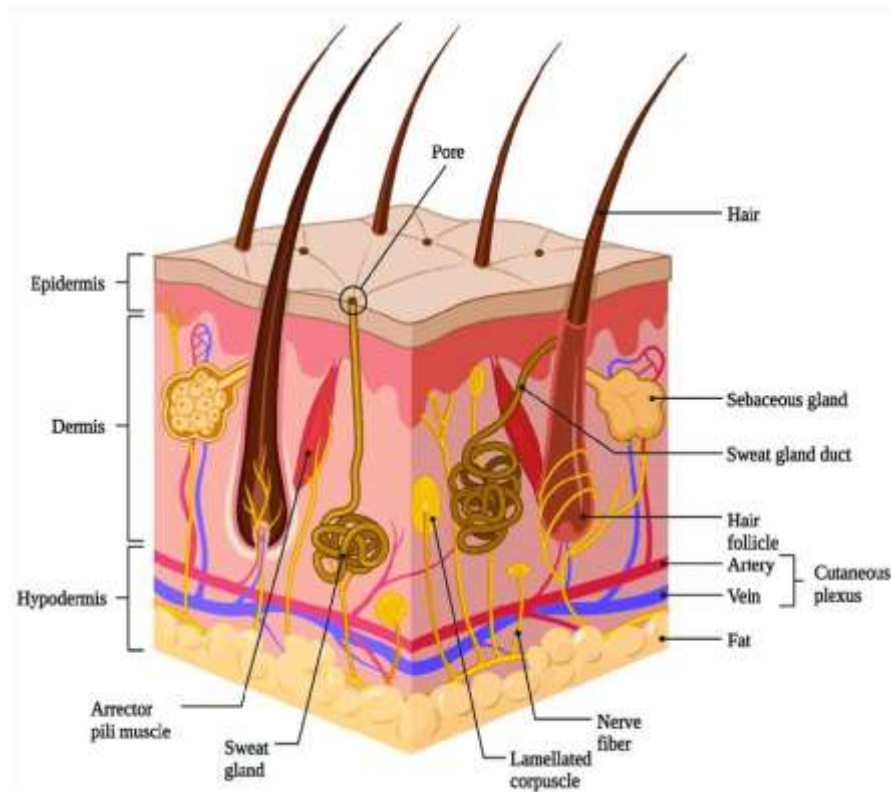
Herbal soap is mainly applied in the surface of skin so its very important to know about anatomy of skin :-

The skin is the body's largest organ, serving as a protective barrier between the internal organs and the external environment. It consists of three main layers: the epidermis, dermis, and hypodermis (subcutaneous tissue). The skin plays crucial roles in regulating body temperature, protecting against pathogens, and providing sensations such as touch, heat, and cold. It also helps in the synthesis of vitamin D when exposed to sunlight. Additionally, the skin plays a significant role in our appearance and can be affected by various factors such as age, genetics, diet, and environmental factors. Taking care of the skin through proper hygiene, hydration, and protection from harmful UV rays is essential for maintaining its health and vitality.

Layer of skin:-

The skin consists of three main layers:

- **Epidermis**: The outermost layer of the skin, primarily composed of epithelial cells. It serves as a protective barrier against environmental factors, pathogens, and UV radiation. The epidermis also contains melanocytes, which produce melanin, the pigment responsible for skin color.
- **Dermis**: The middle layer of the skin, composed of connective tissue containing blood vessels, nerve endings, hair follicles, and sweat glands. The dermis provides structural support and elasticity to the skin and contains collagen and elastin fibers, which give the skin its strength and flexibility.
- **Hypodermis (subcutaneous tissue)**: The deepest layer of the skin, composed of adipose tissue (fat) and connective tissue. The hypodermis acts as an insulator, providing cushioning and energy storage, and helps regulate body temperature.
- Each layer of the skin has its own functions and contributes to the overall health and integrity of the skin.



Herbal soap:-

Defination :

Herbal soap refers to a type of soap that is formulated using natural ingredients derived from plants, herbs, and botanical extracts. These soaps are typically made with a blend of essential oils, dried herbs, fruits, and other natural additives known for their beneficial properties for skin health.

Advantages:

- **Natural Ingredients :-** Herbal soaps are made from natural ingredients such as plant extracts, essential oils, and herbs.
- **Moisturizing Properties :-** Many herbal soaps contain moisturizing ingredients like glycerin, coconut oil, or shea butter, which help hydrate the skin and prevent it from drying out. This can be particularly beneficial for people with dry or sensitive skin.
- **Antioxidant Benefits :-** Herbs and botanical extracts used in herbal soaps often contain antioxidants that help protect the skin from environmental damage caused by free radicals.
- **Therapeutic Effects :-** Certain herbs and essential oils used in herbal soaps have therapeutic properties that can benefit both the skin and overall well-being.
- **Cleansing agent:-** which remove the dust, dead cells and dirt that chokes the pores on the skin. Some of the common cleansers include vegetable oils like coconut, sesame and palm oil.
- **Use of Toners:-** The toners help to tighten the skin and keep it from being exposed to many of the toxins that are floating in the air or other environmental pollutants. Some of the herbs used as toners are witch hazel, geranium, sage, lemon, ivy burdock and essential oils.

MATERIAL AND METHOD

➤ Ingredients of herbal soap formulation& its role/ uses

Sr.No.	Material/Ingredients	Role/uses
	Soap base	Cake formation
	Moringa oleifera leaves extract	Vitamin-A & C, Anti-inflammatory
	Rose Rubiginose Petals	Antioxidant, Reduces wrinkles, Hydrates skin
	Azadirachta indica leaf extract	Antibacterial property
	<u>Sapindus mukorossi</u> powder	Exfoliating property & Natural body cleanser
	Glycerine	Moisturizing agent & solvent

INGREDIENTS

1) Soap base:

- It is used for cake formation.
- It is make smoothness of soap .

Sr No.	Ingredient	Role/ use
	Sodium hydroxide	Lye
	Coconut oil	Anti-ageing,soothe skin
	Distilled water	Aqueous vehicle



Fig 1- Soap Base

2) Azadirachta Indica



Fig 2 – Azadirachta Indica

Synonym- Azadirachta indica, Neem tree

Biological Source :- fresh or dried leaves and seed oil of Azadirachta indica J. Juss (Melia Indica or M. azadirachta Linn.) belonging to Family – Meliaceae

Geographical Source :- It grows in tropical and semi tropical regions and is widely found in Burma, India and Pakistan. This is a very fast growing, ever green tree which reaches the height of 15 to 20 meters.

3] **Moringo oleifera leaves** :-



Fig 3 :- Moringo oleifera leaves

Synonym:- Drumstick

Biological source :- It can consist of dried, long , slender seed-pods of Moringa oleifera belonging to Family :- Moringaceae.

Chemical constituent – Nitrates , Quercetin, Glucosides

Geographical source :- Moringa is a plant that is native to the sub-Himalayan areas of India, Pakistan, Bangladesh, and Afghanistan. It is also grown in the tropics

Moringa oleifera, or moringa, is a popular choice for herbal soap due to its numerous skincare benefits. Rich in vitamins, minerals, and antioxidants, moringa helps cleanse and nourish the skin, promoting a healthy complexion. Its anti-inflammatory properties can also soothe skin irritations, making it an excellent ingredient for sensitive skin. Additionally, moringa's natural cleansing properties make it effective in removing impurities and dirt from the skin, leaving it feeling refreshed and rejuvenated.

4] Rose Rubiginose Petals:-

Synonym:- Rose

Family :- Rosaceae

Rose petals are often used in herbal soap for their natural fragrance and skin-nourishing properties. They can add a gentle exfoliating texture and a lovely aesthetic to the soap. Additionally, rose petals contain antioxidants and vitamins that can help soothe and moisturize the skin.



Fig 4 :- Rose Rubiginose

5] Glycerine :-

- a) It is used as moisturizing agent.
- b) Glycerine is used as a humectant in soap. In other words, glycerine helps assure that your skin retains its natural moisture in order to prevent it from harm caused by dryness. Humectants, such as glycerine, help your skin to breathe while without forming a barrier.
- c) Glycerine also used as a solvent .



Fig 5: Glycerine

6] Coconut oil :-

- Coconut oil may be used to soothe inflammatory skin, decrease redness, and moisturise the skin. It is rich in fatty acids that nourish and protect your skin and the oil used for relief crack skin.
- It is promoting wound healing and Coconut oil may help minimise the stretch marks.
- Coconut oil-based soap contains antibacterial, antifungal, anti-inflammatory properties, anti-ageing properties. it may help with a variety of skin ailments.
- Coconut oil is moisturising enough to treat especially the most delicate skin.
- It may act as lather enhancer .



Fig 6 – Coconut Oil

7] Sapindus mukorossi powder:-

Common name- Reetha

Sapindus mukorossi Gaertn., a member of the family Sapindaceae, is commonly known by several names such as soapnut, soapberry, washnut, reetha.

The *Sapindus mukorossi* is a fairly large, deciduous tree with a straight trunk up to 12 meters in height, sometimes attaining a height of 20 m and a girth of 1.8 m, with a globose crown and rather fine leathery foliage. Bark is dark to pale yellow, fairly smooth, with many vertical lines of lenticels and fine fissures exfoliating in irregular wood scales.

Family- Sapindaceae

Chemical constituent- saponins (10%-11.5%), sugars (10%) and mucilage



Fig 7- Reetha

PROCEDURE

Method of extraction :-

1) Moringa oleifera leaves:-

- First of all collect the Moringa oleifera branches from the local area, leaves separate from the branches and wash it.
- Leaves pour in the grinder and add sufficient amount of distilled water and grind it.
- After the grinding Moringa oleifera extract is filter using the filter paper.
- Then Moringa oleifera extract collect in a suitable container and store it.

Extraction of Moringa oleifera leaves		
		
Branches of M. oleifera leaves	Separate the M. oleifera leaves	M. oleifera leaves pour in grinder
		
Grinded leaves	Filter the extract	Extract of M. oleifera leaves

Fig- 7: Extraction of Moringa oleifera leaves

2) Azadirachta indica :-

Method of preparation of neem extract :-

- **Gather Neem Leaves:** Collect fresh neem leaves. Ensure they are clean and free from any contaminants.
 - **Wash the Leaves:** Rinse the neem leaves thoroughly under running water to remove any dirt or impurities.
 - **Chop the Leaves (Optional):** If you prefer, you can chop the neem leaves into smaller pieces. This can help release more of their active compounds during extraction.
 - **Boil Water:** In a pot, bring water to a boil. The amount of water you need depends on how concentrated you want your extract to be and how many neem leaves you have.
 - **Add Neem Leaves:** Once the water reaches a rolling boil, add the neem leaves to the pot. Use approximately one handful of neem leaves per liter of water for a moderately concentrated extract.
 - **Simmer:** Reduce the heat to low and let the neem leaves simmer in the water for about 15-20 minutes. This allows the active compounds in the neem leaves to infuse into the water.
-
- **Strain:** After simmering, remove the pot from heat and let it cool down for a few minutes. Then, strain the liquid to remove the neem leaves. You can use a fine mesh strainer or cheesecloth for this.
 - **Store:** Transfer the neem leaf extract into a clean, airtight container. Store it in the refrigerator if you're not using it immediately. Properly stored, it should remain potent for several days.



Fig- 7: Extraction of _Neem

Method of Preparation of soap base :-

Sr.No.	Ingredient	Quantity
	Sodium Hydroxide	13.20 gm
	Coconut oil	75 ml
	Distilled water	Q.S 2ml

Table-3:Preparation of herbal soap

Procedure:

- 1) For preparing the soap base, first of all take 75 ml coconut oil in a 500 ml beaker.
- 2) Put the coconut oil in the water bath and stir-boil it until a strong consistency forms at a temperature between 40 to 45 °C.
- 3) Then take 13.20 gm sodium hydroxide dissolve in 24 ml distilled water in a another beaker and mixed properly.
- 4) After preparing ,this solution was added slowly in coconut oil mixture with constant stirring.
- 5) The mixture was boil at 40–45 °C until base consistency is attained and then this mixture was used as a soap base.

Method Of preparation of herbal soap :-

	Soap Base	60 gm
	Moringa oleifera leaves extract	10 ml
	Rose Rubiginosa petals	2 gm
	Azardirachta indica	1 ml
	Sapindus Mukorosissi powder	0.50 gm
	Glycerine	10 ml

Table- 4: Formulation of Herbal Soap**Procedure:**

- 1) Take 60 ml of soap base in a beaker and put on water bath at 45°C.
- 2) Then add the all ingredient (M. oleifera leaves extract, Rose Rubiginosa petals , Azardirachta indica leaf extract extract, S. mukorosissi powder and glycerine) with continuous stirring in to soap base.
- 3) Boil the mixture on the water bath at 45°C and soap mixture is prepared.
- 4) Prepared soap mixture is filled in soap moulds and mould is put in the refrigerator for 15 minutes.
- 5) After solidification cut the soap mould using cutter or blade.
- 6) Then obtained herbal soap.

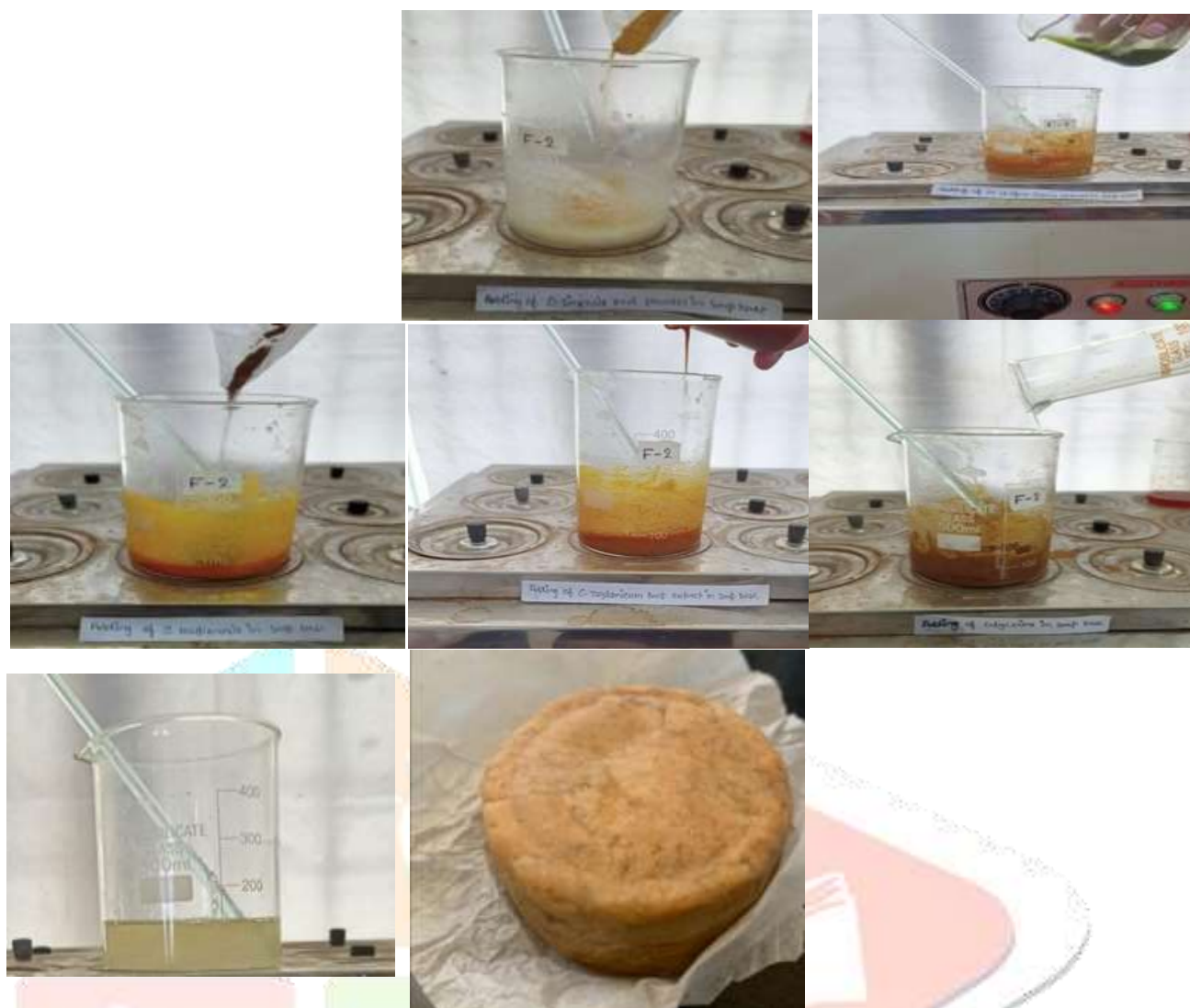


Fig 9 – Prepared herbal soap

Evaluation of herbal Soap

- **Colour :-** When visualising the herbal soap, a white background was used so that the colour could be determined and so that the clarity of formulations is seen.
- **Odour/Aroma :-** An evaluation of the odour of formulations we used two different methods. The first method included heating the sample on a hot plate.
- **Shape:-** Evaluation of organoleptic properties, such as shape and clarity, was carried out by sensory and visual examination.
- **PH :-** In order to determine the pH or hydrogen ion concentration, we must prepare 1% of the sample. We used a pH 4 and pH 7 buffer solution to calibrate the pH metre. Take pH readings at room temperature, just as the reference solution. Record and note the pH level of the solution that was used to calibrate the metre and the electrode. The final readings were determined by taking an average of the three different readings that were obtained from each of the samples after they were each examined three times.

- **Dirt dispersion:-** First, we prepare a 1% sample solution that was taken in a measuring cylinder and added two drops of ink in to the sample solution. The measuring cylinder was then shaken ten times while being covered by a hand .The ink is present concentrate in the foam is considered to be of low quality, investigate that. The remaining dirt particles are then found in the water section. The amount of ink found in the foam was noticed.
- **Wetting time :-** We take a piece of cotton fabric, cut it into a disc shape with a diameter of one inch, and then measure the sample's weight so that we may determine how long it took the sample to get wet. The next step is to prepare a sample that has been diluted (a 1% solution), as well as a piece of cotton cloth to lay on top of the sample. The disc made of fabric was allowed to float freely on top of the 1% sample solution. The amount of time that it took for the fabric disc to go from floating to sinking was carefully recorded and referred to as the wetting time .A higher wetting efficiency is associated with a shorter time to sink.
- **Foam forming ability:-** The Cylinder Shake Method was utilised to determine the Foaming ability. First, in a 100 ml measuring cylinder, we put 50 ml of a 1% sample solution and shaken vigorously 10 times. After shaking for 1 minute, we measured the height of the foam that had formed and recorded the total volume of foam.
- **Foam stability :-** The Cylinder Shake Method was utilised to determine the Foaming ability. First, in a 100 ml measuring cylinder, we put 50 ml of a 1% sample solution. The cylindrical container was covered up with the use of the hand and shaken vigorously 10 times. The volume of the foam after ten minutes was calculated.
- **Moisture content :-** About 10 gram of the material were heated in a hot air oven at 100 to 105 degrees Celsius for an hour. After that deducted the true weight of the tarred china dish from the total weight of the sample and dish. The weight of the material was recorded, and the method for calculating the percentage of the moisture content that can be found in it is shown below formula.
- **Skin Irritation test :-** For the determination of irritancy test, Use the soap sample on clean skin to observe for signs of irritation, such as redness, burning, or itching and 24 hours, the situation was monitored.

Results of Evaluation Parameter

Sr .No.	Parameters	Observational Value	Standard value
	Colour and clarity characterization	Light yellow colour	Yellow
	Odour	Characteristic	Characteristic
	Shape	Circular	Circular
	PH	8.5	8.47
	Dirt dispersion	Best	Best
	Wetting time	30 sec	35 sec
	Foam forming ability	9 cm	10 cm
	Foam stability(after 10 min)	3 cm	3.2 cm
	Skin irritation test	No	No

Discussion

The formulation are stable alone with good odour and brown colour. The formulations ph. was found to be 8.7 which is better Ph for skin . The test such anti-microbial, dirt dispersion and skin irritation results was Good , light color and no irritation respectively. all the formulation have good form type, foam type and wetting time which is 30 second. the formulation prepared had the optimum stability and it had better fragrance, better appearance and was found most apricate and better result than other.

Conclusion

In this work has attempted to make and evaluate herbal soap using cold process method. It possess the necessary medicinal characteristics, provide soothe skin, and tackles a range of skin disorders. Some herbal/natural ingredients, such as M. oleifera, C. sinensis peel, C .Azardirachta indica exrtact S. mukorosissi was used to make herbal soap. The prepared formulation has excellent physical properties According to the results of several tests, the formulation has great foaming properties, pH, moisturizing property, etc. The produced herbal soaps show no any side effect. Naturally M. oleifera leaves and bark have good anti-microbial, anti-fungal, anti-inflammatory and also have used to reduce acne, dark spots and other skin problems. The other ingredients like C. sinensis peel, C.Azardirachta indica leaves and coconut oil, etc were proven to be safe and harmless, and is rather useful in terms of providing skin benefits including its moisturising impact and cleansing the skin. Thus, the prepared soaps' potential use in treating skin infections may be investigated further.

References

1. There U G, et al. Formulation of Hand Made Soap by using Goat Milk, International Journal for Research in Applied Science & Engineering Technology, 2022; 10(2): 955-960.
2. Joshi, et al. Fabrication and Valuation of Poly Herbal Soap Via Utilizing A Variety Of Herbal Extracts, IJCRT, 2022; 10(3): 187-193.
3. Sudharani M V, et al. Formulation and Evaluation of *TridaxProcumbens* (L.) Herbal Soaps, Journal of Pharmacy, 2023; 3(1): 1-8.
4. Kumar Sudheer K, et al. Formulate and evaluate the herbal bath soap” using extracts of three plants having ethnic and dermatological importance in ayurveda, namely azadirecta indica, curcuma longa, ocimum tenuiaflorum, Neuroquantology, 2022; 20(12): 1055-1062.
5. Chavan, et al. A research on formulation and evaluation of herbal skin soap, International Journal of Research in Pharmacy and Pharmaceutical Sciences, 2021; 6(3): 22-26.
6. Vigneswaran, et al. Formulation and evaluation of poly herbal soap, World Journal of Pharmaceutical and Medical Research, 2022; 8(2): 170–173.
7. Sucharita G, et al. Formulation and Evaluation of Poly Herbal Anti Bacterial Soap, IJESC, 2020; 10(8): 27165-27173.
8. Rajendra J N, et al. Formulation and Evaluation of transparent skin brightening Coffee soap, International Journal of Pharmaceutical Research and Applications, 2022; 7(3): 669-680.
9. Gomase, et al. Development and Evaluation of Antibacterial Polyherbal Soap, Ijppr.Human, 2019; 15(3): 230-239.
10. Sindhu R K, et al. Formulation development and antimicrobial evaluation of polyherbal soap, Plant Archives, 2019; 19(2): 1342-1346.
11. Patel Anu, et al. Formulation and Evaluation of Herbal Soap, IJSRR, 2022; 11(2): 4272.
12. Talreja, et al. A critical overview on moringa oleifera, journal of global trends in pharmaceutical sciences, 2020; 11(4): 8451-8457.
13. About moringa oleifera is retrieved 02/02/2023 from Pharmacy, website:
14. <https://pharmeasy.in/blog/benefits-of-moringa-forskin/#:~:text=Due%20to%20its%20antibacterial%20properties,the%20spots%20of%20your%20face.>
15. Pawar, et al. Formulation and Evaluation of Polyherbal Soap. Research J. Topical and Cosmetic Sci, 2019; 10(1): 23-28.
16. Joshi, et al. Formulation and Evaluation of Herbal Soap, Shampoo and Face Wash Gel, Journal of Plant Resources, 2019; 17(1):112-117.

17. About Glycerine is retrieved 05/02/2023 from tomsofmaine, website: <https://www.tomsofmaine.com/good-matters/natural-products/what-glycerin-andwhy-it-yoursoap#:~:text=Glycerin%20is%20used%20as%20a,allow%20your%20skin%20to%20breathe>.
18. Muthalib, et al. A literary review on *Cinnamomum zeylanicum* with Special reference to its varieties, IJARIE, 2021; 7(3): 1563-1570.
19. Anant, et al. Formulation and evaluation of herbal soap by using natural ingredients by simple matched, International Research Journal of Modernization in Engineering Technology and Science, 2021; 3(11): 172-177.
20. Chandira et al. Formulation and Evaluation of Herbal Soap by using Melt and Pour Method, Indian Journal of Natural Sciences, 2022; 13(72): 44244-44626.
21. Rajan, et al. Physio-chemical study of various marketed soap samples: a comparative evaluation, The International journal of analytical and experimental modal analysis, 2021; 13(1): 35-41.
22. Haneefa , et al. Formulation and evaluation of medicated soap of *Ixora coccinea* root extract for dermal infections, J. Pharm. Sci. & Res, 2019; 11(8): 3094-3097.
23. Devipriya, et al. Formulation, Development and Characterization of Herbal Soap Using *Borassus flabellifer* and *Curcuma zedoaria*, Int. J. Pharm. Sci. Rev. Res, 2021; 69(2): 134-139.
24. Sanobar, et al. Formulation and Evaluation of Antibacterial Poly Herbal Soap, International Journal of Advanced Research in Science, Communication and Technology, 2022; 2(1):364-372.